Remote Mapping of Land Surface Chemistry by Visible to Thermal Infrared Spectrometry

Since the launch of Landsat Thematic Mapper (TM) in the early 80's satellite remotely sensed data have been widely used in reconnaissance geological mapping. Unfortunately TM only measures the energy from the surface in a few spectral bands limiting its ability to discriminate lithology based on known spectral absorption features. Recently several airborne instruments have become available that acquire data in many spectral bands with spatial resolutions of a few m's. These instruments provide data that allows the mineral composition and weight percent silica of the surface to be mapped remotely providing a valuable new tool for the field geologist.

Initally the causes for the different mineral absorption features are described. This is followed by case studies that demonstrate how these airborne data have been used to aid mapping in Death Valley, CA and Gold Butte, NV. Finally a new spaceborne instrument termed ASTER is described. ASTER was launched at the end of 1999 and has improved spatial and spectral resolution compared with TM. Data from ASTER will be available globablly and be free of charge.